

**ABSTRACT**

The present invention recognizes that marine organisms comprise nucleic acid molecules that encode polypeptides that catalyze the synthesis of bioactive compounds, such as polyketides including bryopyran rings, such as bryostatins. One aspect of the present invention is a composition including at least one nucleic acid molecule that encodes at least one polypeptide that catalyzes at least one step in the synthesis of at least one polyketide such as a bryopyran ring, wherein said at least one nucleic acid molecule is derived from at least one marine organism. A second aspect of the present invention is a composition including a library of nucleic acid molecules of the present invention. These nucleic acid molecules can be used in a combinatorial biosynthesis of polyketides, bryopyran rings and bryostatins.

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